MULTIMEDIA UNIVERSITY®

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2022/2023

HPB2011 –BIOINFORMATICS PROGRAMMING I

(All sections / Groups)

3 JULY 2023
2:30 - 4:30 PM
(2 hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 5 pages, including this cover page.
2. You are required to attempt all questions. All questions carry equal marks (10).
3. Write all your answers in the Answer Booklet provided.
4. You may use a calculator.

Question 1

a)

```
class Exam{
    public static void main(String[] args){
    System.out.println("This is a testing!!!");
    }
}
```

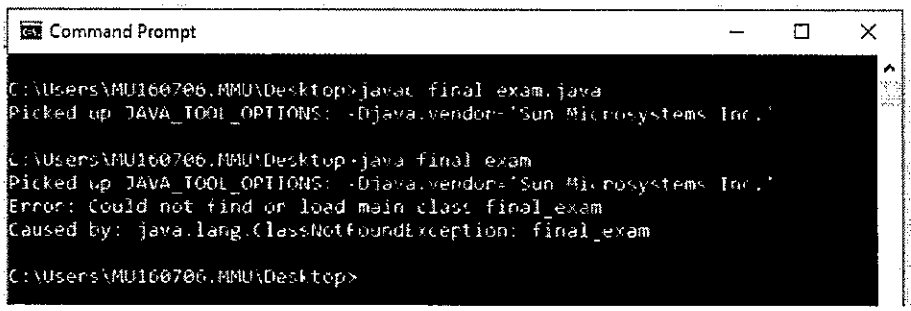
Command Prompt
C:\Users\MU160706.MMU\Desktop>javac final exam.java
Picked up JAVA_TOOL_OPTIONS: -Djava.vendor='Sun Microsystems Inc.'
C:\Users\MU160706.MMU\Desktop>java final exam
Picked up JAVA_TOOL_OPTIONS: -Djava.vendor='Sun Microsystems Inc.'
Error: Could not find or load main class final_exam
Caused by: java.lang.ClassNotFoundException: final_exam
C:\Users\MU160706.MMU\Desktop>

Figure above illustrate a Java code and its executions. Suggest TWO possible solutions for the prompted error. [2 marks]

b) What are the output of the following Java code? [4 marks]

```
class Confusion_num{
    public static void main(String[] args){
    int[] x = new int[5];
    int i;
    System.out.println("A="+ x[2]);
    for (i=0; i<x.length; i++){
        x[i]=i;
    }
    System.out.println("B="+ i);
    System.out.println("C="+ x[4]);
    System.out.println("D="+ x[i]);
    }
}
```

Continued .....

c) Identify the errors and debug the Java code below. [4 marks]

```
class Prime_number(
    int mynumber;
    int remainder;
    String Prime_number(){
        mynumber=0;
        remainder=0;
    }
    void calc_Prime(int mynumber){
        remainder=mynumber%2;
        if (remainder==0){
            System.out.println("This is not a prime number");
    }
        else{
            System.out.println("This is a prime number");
        }
    }
    String disp(int remainder){
        System.out.println(remainder);
    }
)

class Prime_main{
    public static void main(String args[]){
        Prime_number cur_obj = new Prime_number();
        cur_obj.disp(64);
    }
}
```

Continued .....

Question 2

a) Write a Java code to count occurrence of Adenine(A), Guanine(G), Cytosine(C), Thymine(T) from a gene sequence. The code should have the following:

i. a class "Calc_Seq" which contain: [7 Marks]
- a constructor
- a method to calculate A, T, G, C

ii. a class "Gene_calculator": [3 marks]
- main calling method
- to receive user input
- create new object based on the user input

Sample output

Question 3

a) Create a laboratory inventory system in Java code. You may create and name any attributes. However, the code should consist of:

i. a class named "ExistInvent" [5 marks]
- a constructor
- A method to check if an item is already deposited in the system.
- A method to return full list of items
- A method to update the number of item

ii. a class named "NewInvent" [4 marks]
- call "ExistInvent" as a superclass
- a method to add item if not exist in the system

iii. a class named "InventSystem": [1 mark]
- a main method

Continued .....

Question 4

a) Given two sequences S1 = {GCATGC}, S2 = {GATTA}
Score { x=y : 1 ; x ≠ y : -1 ; gap : -2}
Align the sequences with Needleman-Wunsch algorithm. [4 marks]

b) Why is Chou-Fasman known as the simplest approach for protein secondary structure prediction? [1 mark]

c) Describe the GOR derivatives. [4 marks]

d) Name ONE curated protein structure database? [1 mark]

END OF PAPER